

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

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BOARD OF REGENTS, THE UNIVERSITY OF
TEXAS SYSTEM, and 3D SYSTEMS, INC.,

Plaintiffs,

-vs-

Case No. A-03-CA-113-SS

EOS GmbH ELECTRO OPTICAL SYSTEMS,

Defendant.

ORDER

BE IT REMEMBERED that on the 24th day of November 2003 the Court, in accordance with *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996), held a hearing at which the Parties appeared by representation of counsel and made oral arguments on their proposed claims construction. After considering the briefs, responses, the case file as a whole, and the applicable law, the Court enters the following opinion and order.

I. Background

Plaintiffs in this case, the Board of Regents of The University of Texas System ("UT") and 3D Systems, Inc. ("3D") sue EOS GmbH Electro Optical Systems ("EOS"), a German entity, for infringement of United States Patent Numbers 5,639,070 and 5,597,589, which are owned by UT and licensed exclusively to 3D. *See* Complaint at ¶¶ 3, 8, 9, 13 & 14. The Patents-in-suit relate to laser sintering technology, a manufacturing technique that uses a computer-controlled laser to build physical parts from a computer design by melting layers of powder. *See* Plaintiffs' Concise Statement of Alleged Infringement [#46] at 2.

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II. Principles for Claims Construction

Claim construction is a question of law for the Court. *Markman*, 517 U.S. at 384; *Tex. Digital Sys. Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1201 (Fed. Cir. 2002). Claim construction begins with the claim language itself. *Vitronics Corp. v. Conception, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996); *Inverness Med. Switzerland GmbH v. Warner Lambert Co.*, 309 F.3d 1373, 1378 (Fed. Cir. 2002). Terms within a claim are to be accorded their ordinary and accustomed meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Moreover, “a technical term used in a patent is interpreted as having the meaning a person of ordinary skill in the field of the invention would understand it to mean.” *Bell Atlantic Network Serv., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). Dictionaries are useful resources to assist the Court in determining the ordinary and customary meanings of claim terms as well as the meanings that would have been ascribed to technical terms by those of skill in the relevant art. *Tex. Digital Sys.*, 308 F.3d at 1202. However, a technical term will not be assigned its ordinary meaning by one skilled in the art if it is clear from the patent and the file history that the inventor assigned a different meaning to the term. *Phillips Petroleum v. Huntsman Polymers*, 157 F.3d 866, 871 (Fed. Cir. 1998) (quoting *Hoechst Celanese Corp. v. BP Chems. Ltd.*, 78 F.3d 1575, 1578 (Fed. Cir. 1996)). “[A] patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history.” *Vitronics Corp.*, 90 F.3d at 1582.

In an effort to reconcile a disputed claim term, courts should initially examine the intrinsic evidence (the patent itself, the specification, and the claims). *Id.* If an examination of the intrinsic evidence reveals a clear meaning of a disputed term, then that meaning shall apply. *Frank's Casing*

Crew & Rental Tools, Inc. v. PMR Techs., Ltd., 292 F.3d 1363, 1374 (Fed. Cir. 2002). However, extrinsic evidence (including expert and inventor testimony) may be utilized where the claim language remains unclear after consulting the intrinsic evidence. *Id.*

III. Construction of Claim Terms

A. The '070 Patent

1. **Meaning of “heating the second layer of powder to a temperature below the sintering temperature of the powder, to moderate a temperature difference between the second layer of powder and fused portions of the first layer of powder therebeneath;”**

This phrase is used in Claim 1 of the '070 Patent. Defendant asks this Court to construe this claim to require (1) “heating the top layer of unfused powder” and (2) “removing bulk heat from the fused powder.” Defendant’s Brief, at 14. Conversely, Plaintiffs propose the following definition: “adding heat to increase the temperature of the second or newly deposited layer of powder to a temperature below the sintering temperature of the powder, to moderate or lessen a temperature difference between the second or newly deposited layer of powder and the fused portions of the layer of powder directly beneath.” Plaintiffs’ Brief, at 7. The Court adopts Plaintiffs’ proposed definition.

Defendant contends that this phrase should be construed under step-plus-function law. The Plaintiffs disagree. Means-plus-function and step-plus-function limitations are governed by 35 U.S.C. § 112, ¶ 6. In pertinent part, Section 112, Paragraph 6 provides: “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” *See*

35 U.S.C. § 112, ¶ 6. In determining whether a claim element is subject to Section 112, Paragraph 6, a court considers the phrasing of the element at issue. For example, when determining whether a claim element contains a step-plus-function limitation, if the claim element uses the phrase “step for,” then a step-plus-function limitation is presumed to exist, and thus, Section 112, Paragraph 6 is presumed to apply. On the other hand, the term “step” alone and the phrase “steps of” tend to show that Section 112, Paragraph 6 does not govern that element. *See Seal-Flex, Inc. v. Athletic Track & Court Constr.*, 172 F.3d 836, 849 (Fed. Cir. 1999).

In the present case, Claim 1 of the ‘070 Patent uses the phrase “steps of” in the preamble to introduce several “steps.” The specific element at issue recites the step of “heating the second layer of powder to a temperature below the sintering temperature of the powder, to moderate a temperature difference between the second layer of powder and fused portions of the first layer of powder therebeneath.” Because the phrase “step for” is lacking in both the preamble and the disputed claim element, this language tends to show that the verb “heating” recites an act rather than a function.¹ Accordingly, the Court concludes that this phrase is not drafted in step-plus-function form, and therefore, will construe this phrase in accordance with the normal principles of claim construction.

An inventor has the right to define the terms of his claims, so long as the meaning of his expression is reasonably clear and its use is consistent with a patent disclosure. *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984). Unless the inventor specifically defines a term

¹ “If we were to construe every process claim containing steps described by an “ing” verb, such as passing, *heating*, reacting, transferring, etc. into a step-plus-function limitation, we would be limiting process claims in a manner never intended by Congress.” *O.I. Corp. v. Tekmar Co., Inc.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997) (emphasis added).

differently from its ordinary meaning in the patent and file history, the terms of a claim are given their ordinary meaning. *See Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387 (5th Cir. 1992). Defendant points to the file history to support its argument that there exists a limitation on the claim to a method that addresses both curl (also known as potato chipping) and growth.² As part of the application process, the Patentee stated: “Other beneficial effects are also enabled by the method of claim 8, including the removal of bulk heat from the article which prevents growth of the article into the surrounding unfused powder.” Defendant’s Brief, Exh. D, at 178. However, “[u]nless altering claim language to escape an examiner rejection, a patent applicant only limits claims during prosecution by clearly disavowing claim coverage.” *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1575 (Fed. Cir. 1996). Plaintiffs counter that “nowhere did the [A]pplicant say anything that comes close to a clear disavowal.” Plaintiffs’ Response, at 4. Specifically, Plaintiffs argue the “other beneficial effects” statement made by the Applicant was a single, gratuitous, unnecessary, and inaccurate statement that is entirely inconsistent with the other statements made by the Applicant. *Id.* at 4-5. For example, immediately before the “other beneficial effects” sentence cited by Defendant, the Applicant referred only to heating, the Curl Interface, and used “moderate”³ in the sense of “to lessen” the temperature difference between layers at the Curl Interface:

As described in the specification . . . the *heating* of the deposited second layer of powder serves to *moderate* the temperature difference between the newly-deposited

² “Shrinkage” or “curl” is said to be avoided by providing heat to the top layer of powder. Defendant’s Brief, at 3 (citing Exh. A, Col. 6, 11. 42-59). “Growth” is said to be prevented by removing bulk heat from the article being produced. *Id.*

³ The dictionary definition of “moderate” includes “to lessen the intensity or extremeness of.” Defendant’s Brief, Exh. G, *Webster’s Third New International Dictionary* (1981).

second layer of powder and the previously-formed article being produced, reducing thermal *shrinkage* in the article. Defendant's Brief, Exh. D, at 178 (emphasis added).

In fact, the Applicant repeatedly referred only to the Curl Interface, and only to adding heat to lessen the temperature differential between the layers throughout the Amendment:

Further, Applicant respectfully submits that there is no disclosure in the Arcella et al. reference of the step of, after the depositing step, *heating* the deposited layer of powder to moderate the temperature difference [at the Curl Interface] between the second layer of powder and fused portions of the first layer of powder therebeneath, as required by amended claim 8. *Id.* at 180 (emphasis added).

In addition, Applicant respectfully submits that the benefits provided by the method of proposed amended claim 8 further support its patentability and that of its dependent claims. As noted above, the invention of proposed amended claim 8 proves the important advantage of preventing undesirable *shrinkage* of the article by *moderating* the temperature difference between the unfused powder in a new-deposited layer and the underlying article. *Especially considering that any heating performed in the Arcella reference is of fluidized powder rather than of powder deposited over a previously fused and unfused layer, nowhere does the Arcella et al. reference anywhere disclose or suggest that a temperature difference may exist between newly deposited unfused powder and the article being formed, much less suggest the modification of its teaching to address this problem as does the invention of proposed amended claim 8.* *Id.* at 181 (emphasis added).

Further, the exhausting step necessary to prevent growth is expressly claimed in dependent Claim 6:

The method of Claim 5, wherein the exhausting of the directed heated gas is performed from below said target surface. Defendant's Brief, Exh. C.

The Court concludes that the Applicant did not use "words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1091 (Fed. Cir. 2003) (citing *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324 (Fed. Cir. 2002)). Therefore, the Court will interpret the above phrase used in Claim 1 of the '070 Patent to have its ordinary meaning. According to the dictionary and common usage, heat

means “to become warm or hot.” Plaintiffs’ Brief, at 9 (citing *Webster’s Ninth New Collegiate Dictionary* (1985)).⁴ Accordingly, the phrase “heating the second layer of powder to a temperature below the sintering temperature of the powder, to moderate a temperature difference between the second layer of powder and fused portions of the first layer of powder therebeneath” will be defined as “adding heat to increase the temperature of the second or newly deposited layer of powder to a temperature below the sintering temperature of the powder, to moderate or lessen a temperature difference between the second or newly deposited layer of powder and the fused portions of the layer of powder directly beneath.”

B. The ‘589 Patent

1. **Meaning of “temperature control means for moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer.”**

This language is used in Claim 1 of the ‘589 Patent. There is no dispute that this limitation is written in means-plus-function form and falls under 35 U.S.C. § 112, ¶ 6. Section 112, Paragraph 6 provides: “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure . . . in support thereof, and such claim shall be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The first step in the construction of a means-plus-function claim element is to identify the particular claimed function. *Micro Chem., Inc. v. Great Plains Chem.*

⁴ The Federal Circuit has indicated “dictionaries, encyclopedias and treatises, publicly available at the time the patent is issued, are objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art.” *Tex. Digital Sys. v. Telegenix, Inc.*, 308 F.3d 1193, 1202-03 (Fed. Cir. 2002).

Co., 194 F.3d 1250, 1258 (Fed. Cir. 1999). The second step in the analysis is to look to the specification and identify the corresponding structure for that function. *Id.* Under this second step, “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *B. Braun Med. Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997).

Section 112, paragraph 6 “does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.” *Micro Chem.*, 194 F.3d at 1258. “In identifying the function of a means-plus-function claim, a claimed function may not be improperly narrowed or limited beyond the scope of the claim language.” *Lockheed Martin Corp. v. Space Sys./Loral, Inc.*, 324 F.3d 1308, 1319 (Fed. Cir. 2003). Thus, the function of “temperature control means,” is for moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer.

Having identified the function of the relevant means, the Court next construes the meaning of the words used to describe the claimed function, using ordinary principles of claim construction. *Id.* Terms in a claim are to be given their ordinary and accustomed meaning, within the context of the claim. *See Johnson Worldwide*, 175 F.3d at 989-90. The heavy presumption in favor of the ordinary meaning of claim language is overcome if the meaning of the term is unclear from the context of the claim, *see id.*, or if the patentee has chosen to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term. *See id.*; *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (applicant may act as his own lexicographer, but definition must be done with “reasonable clarity, deliberateness and precision”); *Intellicall*, 952 F.2d at 1387-88 (“[w]here an

inventor chooses to be his own lexicographer and to give terms uncommon meanings, he must set out his uncommon definition in some manner within the patent disclosure.”); *Lear Siegler*, 733 F.2d at 888-89 (same).

Plaintiffs argue the plain meaning controls in this case, and sets forth that meaning as “moderating or lessening the temperature difference between the top, cooler layer and the lower, hotter layer at the Curl Interface.” Plaintiffs’ Brief, at 15. Defendant relies on the written description and prosecution history to define Claim 1 to require the function to be interpreted to include both (1) “heating the top layer of unfused powder” and (2) “removing bulk heat from the fused powder.” Defendant’s Brief, at 3. In so doing, Defendant disregards the well-established rule that while proper claim construction requires an examination of the written description and relevant prosecution history to determine the meaning of claim limitations, additional limitations may not be read into the claims. *See, e.g., Prima Tek II, L.L.C. v. Polypap, S.A.R.L.*, 318 F.3d 1143, 1148 (Fed. Cir. 2003); *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998).⁵ The Federal Circuit has recognized that there is sometimes a fine line between reading a claim in light of the written description and relevant prosecution history, and reading a new limitation into the claim. *Comark*, 156 F.3d at 1186. However, “interpreting what is meant by a word in a claim ‘is not to be confused with adding an extraneous limitation . . . which is improper.’” *Intervet Am., Inc. v. Kee-Vet Labs., Inc.*, 887 F.2d 1050, 1053 (Fed. Cir. 1989) (quoting *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed. Cir. 1988)).

⁵ Similarly, the mere fact that drawings depict a particular embodiment of the patent does not operate to limit the claims to that specific configuration. *Hockerson-Halberstadt, Inc. v. Avia Group Int’l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000).

Defendant relies on the fact that column 6, lines 42-62 of the specification of the '589 Patent states:

Still another embodiment is shown in Fig. 11 for controlling the temperature of the article being produced. Undesirable shrinkage of the article being produced has been observed to occur due to differences between the temperature of the particles not yet scanned by the directed energy beam and the temperature of the previously scanned layer. It has been found that a downward flow of controlled temperature air through the target area is able to moderate such undesirable temperature differences. The controlled air temperature air downdraft system 132 of Fig. 11 *reduces thermal shrinkage* by providing heat transfer between the controlled-temperature air and the top layer of powder particles to be sintered. This heat transfer moderates the temperature of [sic] the top layer of particles to be sintered, controls the mean temperature of the top layer, and removes bulk heat from the article being produced, thereby reducing its bulk temperature *and preventing the article from growing into the unsintered material*. The temperature of the incoming air is adjusted to be above the softening point of the powder, but below the temperature at which significant sintering will occur. See Defendant's Brief, Exh. A, Col. 6, 11. 42-62 (emphasis added).

Given the lack of explicit language in Claim 1 requiring bulk heat removal, the written description is not a basis for construing the claim as requiring removal of bulk heat from the fused powder. Defendant's use of the prosecution history to narrow the meaning of Claim 1 is also misplaced. During prosecution, the Applicant stated that in the invention as recited in Claim 1:

"Amended claim 17 now requires that the apparatus include means for successively dispensing a plurality of layers of powder at a target surface, in combination with, among other elements, temperature control means for *moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer*. Support for this amendment may be found in the specification as filed at page 14, line 19 through page 15, line 9. As described thereat, the claimed invention *provides the important feature of reducing distortion due to a temperature gradient between unfused powder and the previously scanned layer, such distortion being made manifest as shrinkage and growth in the part being produced in layerwise fashion*. See Defendant's Brief, Exh. B, at 605 (emphasis added).

While on its face this language appears to limit claim scope, it cannot do so absent some claim

language referring to the removal of bulk heat. The prosecution history statement describes generally the features of the claimed invention. The Applicant's inaccurate statement cannot override the claim language itself, which controls the bounds of the claim. *See Rambus Inc. v. Infineon Techs. Ag*, 318 F.3d 1081, 1089 (Fed. Cir. 2003) (holding that general statement introducing new limitations does not limit scope of claims not amended to include the new limitations); *Intervet*, 887 F.2d at 1054 (holding that erroneous statement made during prosecution does not limit claim scope because "[t]he claims themselves control"). Accordingly, this Court construes the meaning of the claim language "temperature control means for moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer" is moderating or lessening the temperature difference between the top, cooler layer and the lower, hotter layer at the Curl Interface.

After identifying the function of the means-plus-function limitation and construing the meaning of the claim language, the Court looks next to the written description to identify the structure corresponding to the function. *Lockheed Martin Corp.*, 324 F.3d at 1320. The specifications indicate that the "downdraft system 132 broadly includes a support 134 defining target area 136, means for directing air to the target area, and a mechanism for controlling the temperature of the incoming air, such as resistance heater 142."⁶ *See* Defendant's Brief, Exh. A, Col. 6, 11. 63-66. The air directing means "includes chamber 138 surrounding support 134, fan 140 and/or vacuum 141." *Id.*, Col. 6, 1. 41-Col. 7, 1. 1. The specifications go on to state that "[a] plenum 150 is disposed for gathering air

⁶ The heater performs the claimed function of the temperature control means limitation because it lessens the temperature difference between the unfused powder in a topmost layer of powder and fused powder in the previously sintered layer therebeneath.

for passage to outlet 152.” *Id.*, Col. 7, 11. 8-9. Finally, the specifications state “the outlet 152 is connected to vacuum 141 or other air handling mechanism.” *Id.*, Col. 7, 11. 9-10. The only element specified to *provide* heat is a heater. The additional elements disclosed in the specifications relate to *removing* bulk heat (e.g., fan, and vacuum). Per Section 112, Paragraph 6, the method described in Claim 1 is, thus, limited to a heater and its equivalents.⁷

For the reasons set forth above, the Court adopts the following as its claim construction of the phrase “temperature control means for moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer”: a heater and its equivalents that increase the temperature of the unfused powder in the topmost layer of powder at the target surface to moderate or lessen the temperature difference between the unfused powder in the topmost layer of powder and the fused powder in the layer immediately below.

IV. Remaining Claim Terms

In briefing, Defendant sought construction of other terms.

1. “a part” (‘070 Patent, Claim1; ‘589 Patent, Claim1)
2. “depositing a first layer of the powder at a target surface;” (‘070 Patent, Claim 1)
3. “depositing a second layer of powder over both fused and remaining unfused portions of said first layer of powder after said directing step, so that the

⁷ A court may not import into the claim features that are unnecessary to perform the claimed function; features that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations. 35 U.S.C. § 112; *see also Chiuminatta Concrete Concepts v. Cardinal Indus.*, 145 F.3d 1303, 1308-09 (Fed. Cir. 1998) (stating that “additional structural aspects are not what the statute contemplates as structure corresponding to the recited function”).

second layer of powder is supported by fused and remaining unfused portions of said first layer of powder;" ('070 Patent, Claim 1)

4. "after the depositing step[, heating the second layer of powder]" ('070 Patent, Claim 1)
5. "a temperature below the sintering temperature [of the powder]" ('070 Patent, Claim 1)
6. "means for successively dispensing a plurality of layers of powder at a target surface;" ('589 Patent, Claim 1)

The Court agrees with Plaintiffs that the above terms are clear on their face.⁸ Further, Defendant has either failed to propose a construction which clarifies the terms beyond their plain meaning or has failed to provide adequate argument including meaningful citation to the intrinsic record. Accordingly, the Court finds the simple English words contained in these phrases need no defining, and these terms will not be construed by this Court.

V. Summary of Court's Claim Construction of Disputed Terms

For the reasons set forth above, the Court adopts the following as its claim construction of the disputed terms of the Patents-in-suit:

"heating the second layer of powder to a temperature below the sintering temperature of the powder, to moderate a temperature difference between the second layer of powder and fused portions of the first layer of powder therebeneath;"

This phrase means "adding heat to increase the temperature of the second or newly deposited layer of powder to a temperature below the sintering temperature of the powder, to moderate or lessen a temperature difference between the second or newly deposited layer of powder and the fused portions of the layer of powder directly beneath."

⁸ These terms can be readily understood by the lay reader (of which this Court is one).

“temperature control means for moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer.”

This language means “a heater and its equivalents that increase the temperature of the unfused powder in the topmost layer of powder at the target surface to moderate or lessen the temperature difference between the unfused powder in the topmost layer of powder and the fused powder in the layer immediately below.”

Accordingly, the Court enters the following orders:

IT IS ORDERED that the above construction of the patent claims will be incorporated into any jury instructions given in this cause and will be applied by the Court in ruling on the issues raised in summary judgment; and

IT IS FURTHER ORDERED that the Parties shall have ten (10) days, from the date of this Order, to object or comment on the above construction of the patent claims.

SIGNED this the 3rd day of December 2003.



SAM SPARKS
UNITED STATES DISTRICT JUDGE